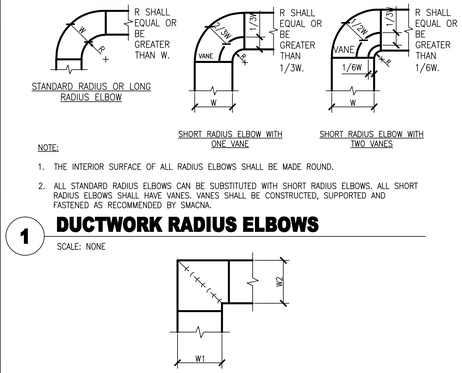


NOTE:

1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
2. ALL STANDARD RADIUS ELBOWS CAN BE SUBSTITUTED WITH SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.

1 DUCTWORK RADIUS ELBOWS

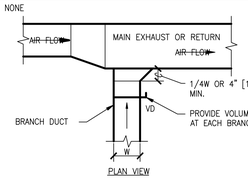
SCALE: NONE

NOTE:

1. ALL VANE ELBOWS SHALL BE CONSTRUCTED AND INSTALLED AS DETAILED BY SMACNA.
2. WHEN W1 DOES NOT EQUAL W2, VANE SHALL BE SINGLE THICKNESS VANE TYPE REGARDLESS OF W DIMENSION.
3. ALL SINGLE THICKNESS VANES SHALL HAVE A 2" [50mm] RADIUS, 1 1/2" [40mm] MAXIMUM SPACE BETWEEN VANES AND A 3/4" [20mm] TRAILING EDGE.
4. WHEN W EQUALS W2 AND W1 IS GREATER THAN 20" [500mm] VANES SHALL BE DOUBLE VANE TYPE.

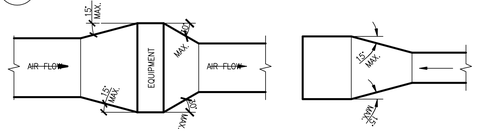
2 DUCTWORK SQUARE VANE ELBOWS

SCALE: NONE



3 EXHAUST OR RETURN BRANCH DUCTWORK

SCALE: NONE

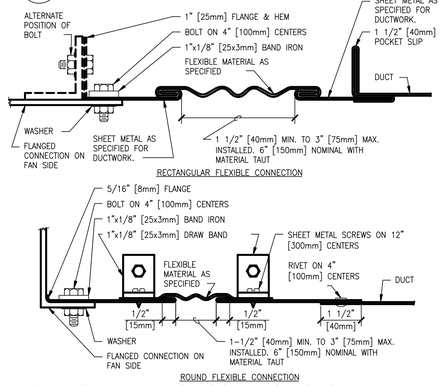


NOTE:
UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.

DUCTWORK TRANSITIONS (WITH EQUIPMENT MOUNTED IN DUCT)

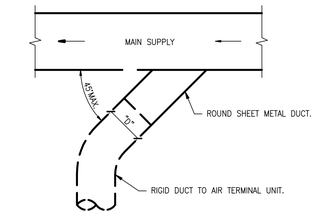
4

SCALE: NONE



5 FLEXIBLE DUCT CONNECTIONS

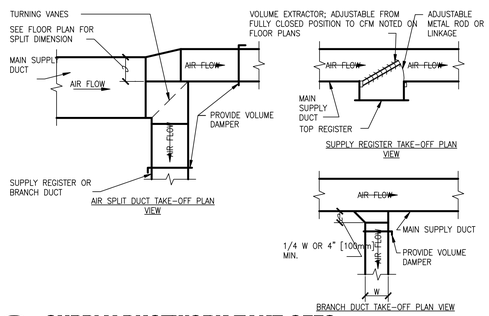
SCALE: NONE



SUPPLY DUCT TAKEOFF AIR TERMINAL UNIT

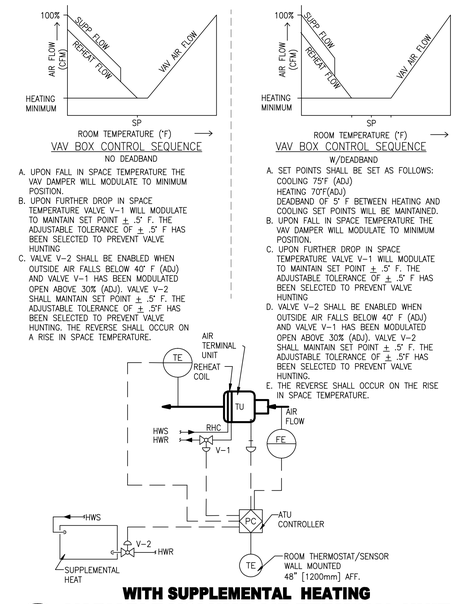
6

SCALE: NONE



7 SUPPLY DUCTWORK TAKE-OFFS

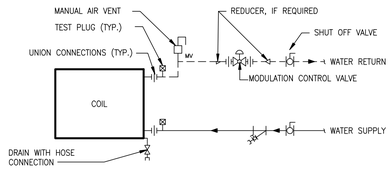
SCALE: NONE



WITH SUPPLEMENTAL HEATING VARIABLE VOLUME AIR TERMINAL UNIT CONTROL DIAGRAM

8

SCALE: NONE



TERMINAL UNIT WATER COILS - PIPING CONNECTIONS

9

SCALE: NONE

CONDENSING UNIT SCHEDULE

GENERAL NOTES:

- COOLING CAPACITY BASED ON INDOOR 80 DB / 67 WB AND ENTERING AIR & 95 DB OUTSIDE AMBIENT.
- HEATING CAPACITY BASED ON INDOOR 70 DB AND ENTERING AIR OF 0 DB / 0 WB
- REFRIGERANT LINE SIZES FOR LIQUID, DISCHARGE, SUCTION, AND BAL. TUBE SHALL BE SIZED BY MANUFACTURER.
- DISCONNECT BY ELECTRICAL CONTRACTOR
- REFRIGERANT SHALL BE R-410A

MARK	SERVICE	MOUNTING	TERMINAL UNITS SERVED	CFM	HEATING		COOLING (MBH)		ELEC. SERVICE		NUMBER OF CIRCUITS	NOTES
					MBH	AMPS	SENS.	TOTAL	MCA	VOLT/PH/MOCP		
CU-1	CT SCAN SUITE	ROOFTOP	FC-1	N/A	16.2	--	14.4	14.4	72.2	208/3/80	1	1,2,4,6,7
CU-2	CT SCAN SUITE	ROOFTOP	FC-1	N/A	16.2	--	14.4	14.4	72.2	208/3/80	1	1,2,4,6,7
CU-3	NORTHWEST AND SOUTHEAST	ROOFTOP	FC-2, FC-3, FC-4, FC-5	N/A	16.2	--	14.4	14.4	72.2	208/3/80	1	1,3,5

NOTES:

1. MOUNT COMPRESSOR ON RUBBER-IN-SHEAR ISOLATORS
2. UNIT IS A HEAT RECOVERY CONDENSING UNIT WITH INVERTER. HEATING OPERATION TO 0 DEGREES F. VFD CONTROLLED OUTDOOR FAN MOTOR, CONTINUOUS HEATING DURING DEFROST, MANIFOLDING KIT
3. SINGLE POINT POWER CONNECTION.
4. CONDENSING UNIT IS A COMBINATION OF TWO (2) CONDENSING UNITS. EACH INDIVIDUAL CONDENSING UNIT REQUIRES AN ELECTRICAL FEED, WIRE PER MFG. INSTRUCTION.
5. INSTALL UNIT ON VIBRATION ISOLATION PADS, MINIMUM 1/4" DEFLECTION, FURNISHED BY UNIT MFG.
6. CONDENSING UNIT SIZING BASED ON UNITS ABILITY TO PROVIDE 120% OF MAXIMUM CONNECTED LOAD. MFG. TO ADJUST SIZING BASED ON DIFFERENT UNIT PERFORMANCE.
7. CONNECT TO EMERGENCY POWER SYSTEM.

FAN SCHEDULE

FAN TYPE

1. IN-LINE
2. SKIMMER ROOF VENTILATOR
3. CEILING EXHAUSTER
4. WALL PROPELLER
5. UP-BLAST ROOF EXHAUSTER
6. UTILITY SET
7. CENTRIFUGAL
8. BACKWARD INCLINED
9. FORWARD CURVED
10. GRAVITY ROOF VENTILATOR
11. ENERGY RECOVERY VENTILATOR

MISCELLANEOUS

1. GRAVITY BACKDRAFT DAMPER
2. MOTORIZED BACKDRAFT DAMPER INTERLOCKED WITH ENERGY RECOVERY VENT. INDICATED – WIRING BY M.C.
3. 85% BIRDSCREEN – GALVANIZED
4. 14" INSULATED ROOF CURB – VERIFY ROOF CONSTR.
5. HOUSING INSULATED KIT
6. HANGING VIBRATION ISOLOATORS
7. BASE VIBRATION ISOLATORS
8. BELT AND/OR MOTOR GUARD
9. INTEGRAL DISCONNECT SWITCH
10. 2-SPEED MOTOR AND SWITCH
11. FAN SPEED CONTROLLER
12. WALL MTD. SWITCH WITH PILOT LIGHT
13. INTERLOCK WITH LIGHT SWITCH – WIRING BY E.C.
14. ALUMINUM CONSTRUCTION, ENAMEL FINISH

MARK	QTY REQ'D	FAN TYPE	DUTY OR SERVICE	CFM	S.P. W.G.	RPM	MOTOR HP	MOTOR VOLT	MOTOR PHASE	DRIVE	BUILDING OPENING	MFR.	MODEL	SERVING AREA/ EQUIPMENT	MISC.	NOTES
EF-1	1	2	EXHAUST	1,200	0.50	1725	1/3	120	1	DIRECT	---	--	--	CT SCAN ROOM	1,4,9,12	
IH-1	1	10	INTAKE	1,100	--	--	--	--	--	--	12" INS.	--	--	--	2,3,14	

VARIABLE REFRIGERANT VOLUME TERMINAL UNIT SCHEDULE

UNIT TAG	TYPE	SERVED BY	TEMP SENS. AND UNIT CONTROLS	AIR FLOW (CFM)			COIL(S) INFORMATION					NOTES
				MAXIMUM	MINIMUM COOLING	MINIMUM HEATING	CAPACITY COOLING (MBH)	CAPACITY HEATING (MBH)	E.S.P.	REFRIG. LIQUID SIZE	REFRIG. GAS SIZE	ELECTRICAL AMPACITY/ MOCP	
FC-1	CLG. MTD. DUCTED	CU-1	BY MFG.	2,040	1,730	1,467	48	54	0.6	3/8	5/8	350/15	1,2,3,4,5,6
FC-2	CLG. MTD. DUCTED	CU-2	BY MFG.	350	330	310	12	13.5	0.6	1/4	1/2	84/15	1,2,3,4,5,6
FC-3	CLG. MTD. DUCTED	CU-2	BY MFG.	688	618	565	24	27	0.6	1/4	1/2	350/15	1,2,3,4,5,6
FC-4	CLG. MTD. DUCTED	CU-2	BY MFG.	688	618	565	24	27	0.6	1/4	1/2	350/15	1,2,3,4,5,6
FC-5	CLG. MTD. DUCTED	CU-3	BY MFG.	688	618	565	24	27	0.6	1/4	1/2	350/15	1,2,3,4,5,6

NOTES:

1. DIRECT-EXPANSION COIL PKG. W/FACTORY MTD. THERMAL EXPANSION VALVE AND EQUALIZING TUBE
2. R-I-S VIBRATION ISOLATORS
3. PROVIDE ONE (1) SOLENOID VALVE KIT PER DIRECT EXPANSION TERMINAL UNIT
4. UNIT SHALL BE UL-LISTED
5. PROVIDE FACTORY MOUNTED CONDENSATE PUMP ASSEMBLY
6. WASHABLE FILTER KIT

ELECTRIC HEATING UNIT SCHEDULE

GENERAL NOTES:

- VERIFY/COORDINATE CABINET DIMENSIONS, MOUNTING AND ACCESS REQUIREMENTS WITH ARCHITECTURAL DRAWINGS PRIOR TO ORDERING.
- LINTELS FOR FULL & SEMI-RECESSED UNIT WALL OPENING PROVIDED BY GENERAL CONTRACTOR.
- RECESSED UNITS TO HAVE FOUR(4) SIDE OVERLAP UNLESS OTHERWISE NOTED.
- CABINET COLOR SHALL BE SELECTED BY THE ARCHITECT FROM MFR STANDARD COLOR CHART.
- REFER TO SPECIFICATIONS FOR APPROVED EQUALS.
- UNIT SHALL BE PROVIDED WITH INTERNAL DISCONNECT SWITCH AND/OR INTEGRAL OVERCURRENT PROTECTION AS REQUIRED BY CODE.
- THREE (3) PHASE COIL LOADS SHALL BE DIVIDED EVENLY ACROSS EACH PHASE.
- ELECTRIC SERVICE TO THREE (3) PHASE UNITS TO BE THREE (3) WIRE UNLESS OTHERWISE NOTED.
- MOUNTING HEIGHT SHALL BE IN ACCORDANCE WITH THE MFR'S RECOMMENDATIONS AND VERIFIED WITH THE ARCHITECT.

MARK	QTY REQ'D	DESCRIPTION	MOUNTING	AREA SERVED	CFM	HEATING			ELEC. SERVICE		FAN MOTOR		APPROX. CABINET DIM.			NOTES
						BTU/HR	KW(MIN.)	KW(MAX.)	AMP	VOLT/PH	RPM	HP	LENGTH	DEPTH	HEIGHT	
EWH-1	1	ELEC. FAN FORCED HEATER	SURFACE	MECHANICAL ROOM	100	5110	1.5	1.5	12.5	208/1	---	---	14 3/16"	4"	19 3/16"	1

NOTES:

1. SURFACE MOUNTED FRAME, UNIT MOUNTED 120-VOLT THERMOSTAT, WITH THERMAL CUT-OUT.

AIR DEVICE SCHEDULE

TYPE

1. CEILING DIFFUSER
2. PERFORATED CEILING DIFFUSER
3. LINEAR BAR DIFFUSER
4. LOUVERED GRILLE / REGISTER
5. STEEL
6. ALUMINUM
7. (1) – 1" LINEAR SLOT DIFFUSER
8. EGGCRATE
9. BAR GRILLE
10. LINEAR BAR GRILLE – SUPPLY
11. LINEAR BAR GRILLE – RETURN
12. DOUBLE DEFL SUPPLY REG.
13. ALUMINUM EGG CRATE
14. GYM GRILLE
15. ADJUSTABLE SLOT DIFFUSER
16. ALUMINUM CONTROL DAMPER
17. SIDEWALL LINEAR

FINISH

1. OFF-WHITE BAKED ENAMEL
2. ETCHED CLEAR LACQUERED
3. ANODIZED
4. ANODIZED ALUMINUM.
5. SEE ARCHITECT

MISCELLANEOUS

1. VOLUME DAMPER
2. OPPOSED BLADE DAMPER
3. DAMPER ACCESS FROM FACE
4. FIRE DAMPER
5. COMBINATION DAMPER (FIRE/VOLUME)
6. BLACK INTERNALS
7. FILTERED RETURN
8. BACKDRAFT DAMPER
9. DIFFUSER-SIZED PLENUM ATTACHED

GENERAL NOTES

- REFER TO SPECIFICATIONS FOR APPROVED MANUFACTURERS.
- SUPPLY AIR DIFFUSERS SHALL BE 4-WAY BLOW UNLESS OTHERWISE NOTED ON DRAWINGS.
- M.C. TO VERIFY CEILING/WALL/FLOOR TYPE BEFORE ORDERING DEVICE.
- APPROX. HEIGHT TO BOTTOM – FIELD VERIFY & COORDINATE WITH ARCHITECT.

MARK	DESCRIPTION	MODULE SIZE	DUTY	CFM	TYPE	FINISH	MODEL NUMBER	MFR.	CLG./WTG. HT.	MISC	NOTES
S1	SQUARE	12" X 12"	SUPPLY	VARIES	1,5	1	N/A	N/A	CEILING	1,6	
S2	SQUARE	24" X 24"	SUPPLY	VARIES	1,5	1	N/A	N/A	CEILING	1,6	
S3	LINEAR	1" X 48" (1)	SUPPLY	VARIES	6,7	2	N/A	N/A	CEILING	1,9	
S4	LINEAR	1" X 24" (1)	SUPPLY	VARIES	6,7	2	N/A	N/A	SOFFIT/SIDEWALL	1	
R1	SQUARE	24" X 24"	RETURN	VARIES	6,8	1	N/A	N/A	CEILING	1,7	
R2	SQUARE	12" X 12"	RETURN	VARIES	6,8	1	N/A	N/A	CEILING	1,7	
E1	SQUARE	12" X 12"	EXHAUST	VARIES	6,8	1	N/A	N/A	CEILING	--	
"S"	EXISTING	3" X 48"	SUPPLY	159	3,6,17	2	N/A	N/A	SIDEWALL	2	1,2
"R"	EXISTING	12" X 24"	RETURN	317	6,8	1	N/A	N/A	CEILING	2	1,2

NOTES:

1. REUSE EXISTING DEVICES SALVAGED FROM DEMOLITION.
2. REPLACE WITH IDENTICAL TO EXISTING IF NOT SALVAGED.

MECHANICAL LEGEND

DUCTWORK SYMBOLS

- LOW VELOCITY DUCTWORK
- SA — SUPPLY AIR DUCTWORK
- RA — RETURN AIR DUCTWORK
- EA — EXHAUST AIR DUCTWORK
- FA — FRESH AIR DUCTWORK
- SUPPLY AIR DEVICE W/ FLEX DUCT
- RETURN OR EXHAUST AIR DEVICE
- FLEXIBLE DUCTWORK (MAX. 7 FT.)
- ACOUSTICALLY LINED DUCTWORK
- FLEXIBLE DUCT CONNECTION
- VD FIRE DAMPER
- SD SMOKE DAMPER
- BD BALANCE DAMPER
- TURNING VANES
- MANUAL DAMPER
- SUPPLY AIR
- RETURN OR EXHAUST AIR
- FC-# VRV TERMINAL UNIT #

MISCELLANEOUS

- T THERMOSTAT – ELECTRIC
- TA THERMOSTAT – ELECTRIC, AVERGING
- T THERMOSTAT – PNEUMATIC
- S ROOM SENSOR
- H HUMIDISTAT
- TR TIMER
- H1 EQUIPMENT SYMBOL
- NOTE SYMBOL
- 1 AIR DEVICE SYMBOL
- 123 ROOM NUMBER
- NEW CONNECTION TO EXISTING
- U/C UNDERCUT DOOR 1/2" BY G.C.
- U/C-3/4 UNDERCUT DOOR 3/4" BY G.C.
- DL-1 DOOR LOUVER – NUMBER INDICATES SQUARE FT. OPNG BY G.C.
- AFF ABOVE FINISHED FLOOR
- DIA DIAMETER
- ETR EXISTING TO REMAIN
- E.C. ELECTRICAL CONTRACTOR
- ER EXISTING TO BE RELOCATED
- EF EXHAUST FAN
- ECH ELECTRIC CABINET HEATER
- EUH ELECTRIC UNIT HEATER
- G.C. GENERAL CONTRACTOR
- M.C. MECHANICAL CONTRACTOR
- RCP ELECTRIC RADIANT CEILING PANEL
- WH WATER HEATER (BY OTHERS)

GENERAL NOTES – MECHANICAL

A. MECHANICAL CONTRACTOR SHALL ABIDE BY ALL LOCAL AND/OR STATE CODES AUTHORITY GUIDELINES, SAFETY RULES AND THE VA DESIGN GUIDELINES/ DESIGN MANUALS/ BUILDING STANDARDS.

B. MECHANICAL CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS OF ALL TRADES PRIOR TO BID. THE MECHANICAL CONTRACTOR WILL BE RESPONSIBLE FOR ALL MECHANICAL WORK MENTIONED IN OTHER TRADE'S SPECIFICATIONS AND DRAWINGS.

C. INSULATED FLEXIBLE DUCT RUN-OUTS TO AIR DEVICES WILL NOT EXCEED 6'-0".

D. CONTRACTOR TO VERIFY ALL CEILING/WALL/FLOOR TYPES BEFORE ORDERING AIR DEVICES WITH ARCHITECTURAL PLANS AND COORDINATE LOCATION WITH ARCHITECTURAL AND ELECTRICAL REFLECTED CEILING PLANS.

E. ALL DUCTWORK AND PIPING TO BE RUN ABOVE THE CEILING OR IN THE ATTIC SPACE UNLESS NOTED OTHERWISE.

F. ALL DUCTWORK RUN IN ATTIC SPACE TO HAVE A MINIMUM OF 2" WRAPPED INSULATION. INSULATE THE BACK OF ALL AIR DEVICES TO AVOID CONDENSATION.

G. MECHANICAL CONTRACTOR TO COORDINATE THE LOCATION OF ALL PIPES, DUCTWORK, UNITS, ETC. WITH ALL OTHER TRADES AND EXISTING STRUCTURE. SHIFT LOCATION OR OFF-SET DUCT WHERE NECESSARY.

H. THE LOCATION AND SIZES OF ALL EXISTING PIPING, DUCTWORK, AIR DEVICES, ETC. HAS BEEN DETERMINED FROM EXISTING SITE CONDITIONS AND SHOULD BE CONSIDERED IN ITS APPROXIMATE LOCATION. THE CONTRACTOR SHALL FIELD VERIFY, BEFORE STARTING ANY INSTALLATION OR DEMOLITION, THE EXACT SIZE AND LOCATION OF ALL EXISTING PIPING AND DUCTWORK AT THE POINTS OF CONNECTION AND THAT THERE IS ADEQUATE SPACE TO INSTALL ALL NEW WORK. PROVIDE COORDINATION DRAWINGS AS SPECIFIED IN THE SPECIFICATIONS.

I. THE DRAWINGS AND SPECIFICATIONS ARE NOT INTENDED TO SHOW ALL ITEMS TO BE REMOVED OR RELOCATED. IT IS IMPERATIVE THAT THE CONTRACTOR VISIT THE SITE AND VERIFY ALL QUANTITIES AND EXTENT OF REMOVALS AND RELOCATIONS PRIOR TO BID. FAILURE TO DO SO WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY TO PROVIDE ALL REMOVALS AND RELOCATIONS REQUIRED. COST EXTRAS WILL NOT BE ALLOWED FOR THIS PORTION OF THE PROJECT.

J. ALL DEMOLITION SHALL BE COORDINATED WITH THE OTHER TRADES INVOLVED, INCLUDING THE ARCHITECT'S AND OWNER'S REPRESENTATIVES.

K. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING ALL REMOVED EQUIPMENT FROM THE SITE UNLESS OTHERWISE DIRECTED. INCLUDE CUTTING AND PATCHING ASSOCIATED WITH REMOVAL WORK.

L. CONTRACTOR TO INSPECT AND THOROUGHLY CLEAN ALL AIR DEVICES, FANS, DUCTWORK, ETC. THAT IS DESIGNATED AS EXISTING OR EXISTING TO REMAIN BEFORE BEGINNING ANY NEW WORK. REPLACE DAMAGED DUCTWORK AND INSULATION TO MATCH EXISTING TYPE.

M. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS AND APPLICABLE CODES AND REGULATIONS.

N. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE VA WITH COORDINATION DRAWINGS OF ALL TRADES INVOLVED IN THE PROJECT.

O. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.

P. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR DUCTWORK, PIPING AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

Q. PROVIDE BALANCING DAMPERS ON ALL RUN-OUTS TO SUPPLY AIR DEVICES.

R. ALL REFRIGERANT PIPING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

S. ALL DEVICES LESS THAN 24" SQUARE SHALL BE PROVIDED WITH CENTERING TRIM PLATES. CENTER IN GRID.

T. PROVIDE FILTER RETURN GRILLES AT ALL RETURN LOCATIONS.

DUCT CONSTRUCTION & SEALING

GENERAL NOTES:

- REFER TO SPECIFICATIONS FOR DUCT CONSTRUCTION OPTIONS: SHEET METAL DUCT, INTERIOR LINING, EXTERIOR INSULATION, FIBERGLASS DUCTBOARD, ETC.
- REFER TO SMACNA LOW PRESSURE DUCT STANDARDS FOR DUCT CONSTRUCTION, GAUGE REQUIREMENTS AND JOINT REINFORCEMENT TABLES AND FIGURES.

DUCT SYSTEM	S.M.A.C.N.A. CLASS	
	S.P. CONSTRUCTION	SEAL CLASS
LOW VELOCITY SUPPLY DUCTWORK	+1"	B
RETURN OR RELIEF AIR DUCTWORK	-1"	C
OUTDOOR AIR / FRESH AIR	-0.5"	C
EXHAUST AIR DUCTWORK	-0.5"	C

3023.00

ISSUED FOR BIDDING	01-31-2013
Revisions	Date

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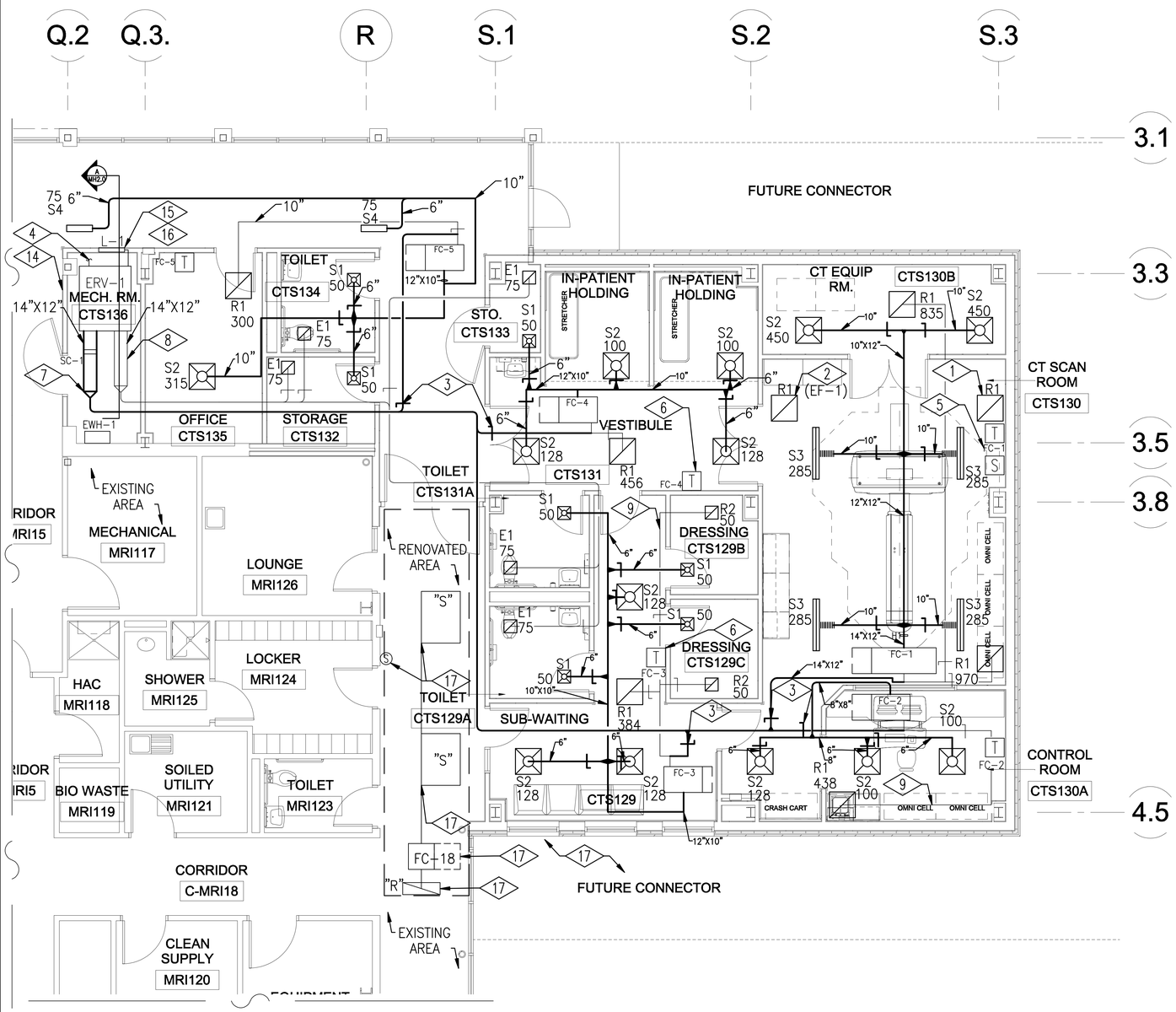
STATE OF OHIO — PARMA NAND SINHA 42622 — REGISTERED PROFESSIONAL ENGINEER

Revised By:

Drawing Title	Project Title	Date
MECHANICAL HVAC SCHEDULES AND DETAILS	SITE PREP FOR CT SCANNER	01-31-2013
Approved: Project Manager: RANDI FIORINA	Building Number: 335 / Checked: PNS / Drawn: CONTECH	Project No.: 552-CSI-333
Approved: Service Chief: GARY ABREU	Location: 4100 WEST THIRD STREET DAYTON, OH 45428	Drawing No.: MH 1.0

VAMC, DAYTON — Department of Veterans Affairs — VA

VA FORM 08-6231, OCT 1978



FIRST FLOOR PLAN - NEW WORK

SCALE: 1/4" = 1 FOOT

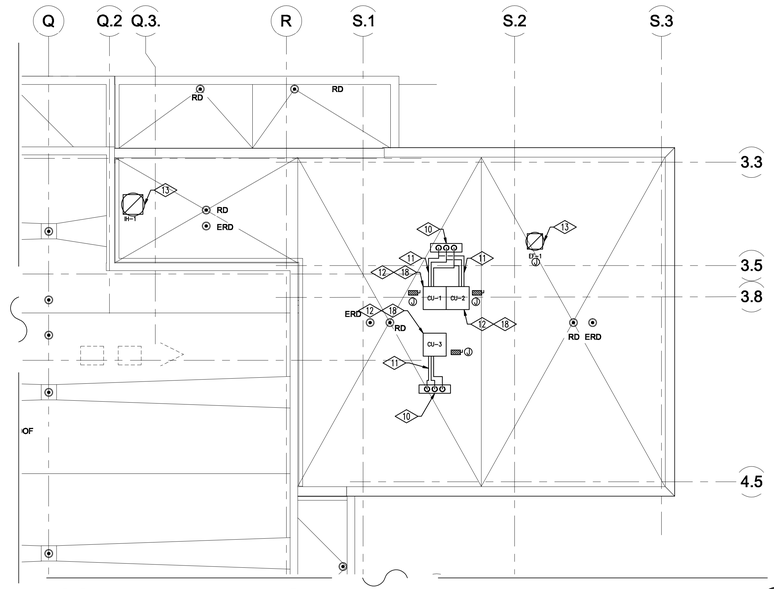
NORTH

DRAWING NOTES – MECHANICAL

1. RELIEF AIR OPENING PROVIDED PER VA STANDARDS.
2. RUN 16" X 16" DUCT UP TO EF-1 MOUNTED ON ROOF.
3. OUTSIDE / OUTDOOR AIR DAMPER. BALANCE TO CFM AS INDICATED ON DRAWINGS.
4. ROUTE 14" X 12" OUTDOOR AIR INTAKE UP TO INTAKE HOOD IH-1 MOUNTED ON ROOF.
5. SENSOR FOR SETPOINT ADJUSTMENT FOR CT SCANNER ROOM. ROOM TEMPERATURE AND HUMIDITY SENSORS MOUNTED IN RETURN AIR DUCTWORK.
6. PROVIDE VANDAL-PROOF COVER.
7. OUTSIDE / OUTDOOR AIR DUCT.
8. EXHAUST DUCT.
9. RETURN DUCT.
10. VARIABLE REFRIGERANT FLOW PIPING DOWN THROUGH ROOF. FURNISH AND INSTALL PIPING CURB. FLASH AND SEAL PER SPECIFICATIONS.
11. ALL PIPING EXPOSED TO WEATHER SHALL BE COVERED AND INSULATED PER SPECIFICATIONS AND COVERED WITH ALUMINUM JACKET MATERIAL.
12. MOUNT CONDENSING UNIT ON ROOF CURB RAILS. FLASH AND SEAL PER SPECIFICATIONS. ELECTRICAL CONNECTIONS BY ELECTRICAL CONTRACTOR – COORDINATE WITH ELECTRICAL CONTRACTOR PRIOR TO INSTALLATION OF ROOF MOUNTED EQUIPMENT. SEE SHEET MH 1.0.

DRAWING NOTES – MECHANICAL (CONTINUED)

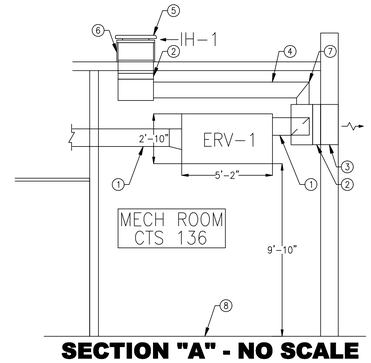
13. MOUNT UNIT ON ROOF CURB. FLASH AND SEAL PER SPECIFICATIONS. ELECTRICAL CONNECTIONS BY ELECTRICAL CONTRACTOR – COORDINATE WITH ELECTRICAL CONTRACTOR PRIOR TO INSTALLATION OF ROOF MOUNTED EQUIPMENT.
14. PROVIDE FIRE DAMPERS ON ALL PENETRATIONS FOR ALL SYSTEMS FROM MECHANICAL ROOM.
15. MOUNT LOUVER L-1 ON SIDEWALL OF HIGH ROOF FACE, NORTH SIDE OF MECHANICAL ROOM.
16. LOUVER L-1: EXHAUST SERVICE, 4" DEEP BY 24" WIDE BY 24" HEIGHT. 1,100 FRM, 0.05" PRESSURE DROP, 2.1 F.A. SQ. FT. CONTRACTOR TO PROVIDE INSULATED SHEETMETAL PLENUM BEHIND ALL LOUVERS. COLOR SHALL BE SELECTED BY ARCHITECT, ASSUME "STONE VENEER" TO MATCH EXTERIOR WALL SURFACE. PROVIDE MOTORIZED DAMPER WIRE TO OPEN WHEN ERV-1 IS IN OPERATION.
17. MINOR DEMOLITION AND REPLACEMENT THIS SPACE. DEMOLISH AND REPLACE CORRIDOR AIR DEVICES, FAN COIL, SENSOR, AND DUCTWORK WHERE REQUIRED FOR CORRIDOR RENOVATION.
18. PROVIDE MANUFACTURER-SUPPLIED CONDENSING UNIT TWINNING KIT. INSTALL TWIN-CONDENSING UNITS PER MANUFACTURER INSTRUCTIONS. MAINTAIN MINIMUM 3' SERVICE CLEARANCE FOR ALL PARTS REQURING ROUTINE AND PREVENTATIVE MAINTENANCE.



ROOF PLAN - NEW WORK

SCALE: 1/8" = 1 FOOT

NORTH



DETAIL NOTES

1. 12" X 14" EXHAUST DUCTWORK
2. MOTOR OPERATED DAMPER, INTERLOCKED WITH ERV-1.
3. OUTDOOR AIR LOUVER, L-1. MOUNT ON HIGH ROOF SIDEWALL, MATCH COLOR WITH EXTERIOR WALL SURFACE FINISH.
4. 12" X 14" OUTDOOR AIR INTAKE DUCTWORK
5. INTAKE HOOD IH-1.
6. 12" HIGH ROOF CURB – FLASH AND SEAL PER MANUFACTURER'S INSTRUCTIONS.
7. PROVIDE TURNING VANES WHERE APPROPRIATE.
8. FINISHED MECHANICAL ROOM FLOOR LEVEL.

SECTION "A" - NO SCALE

3023.00

Revisions	Date
ISSUED FOR BIDDING	01–31–2013

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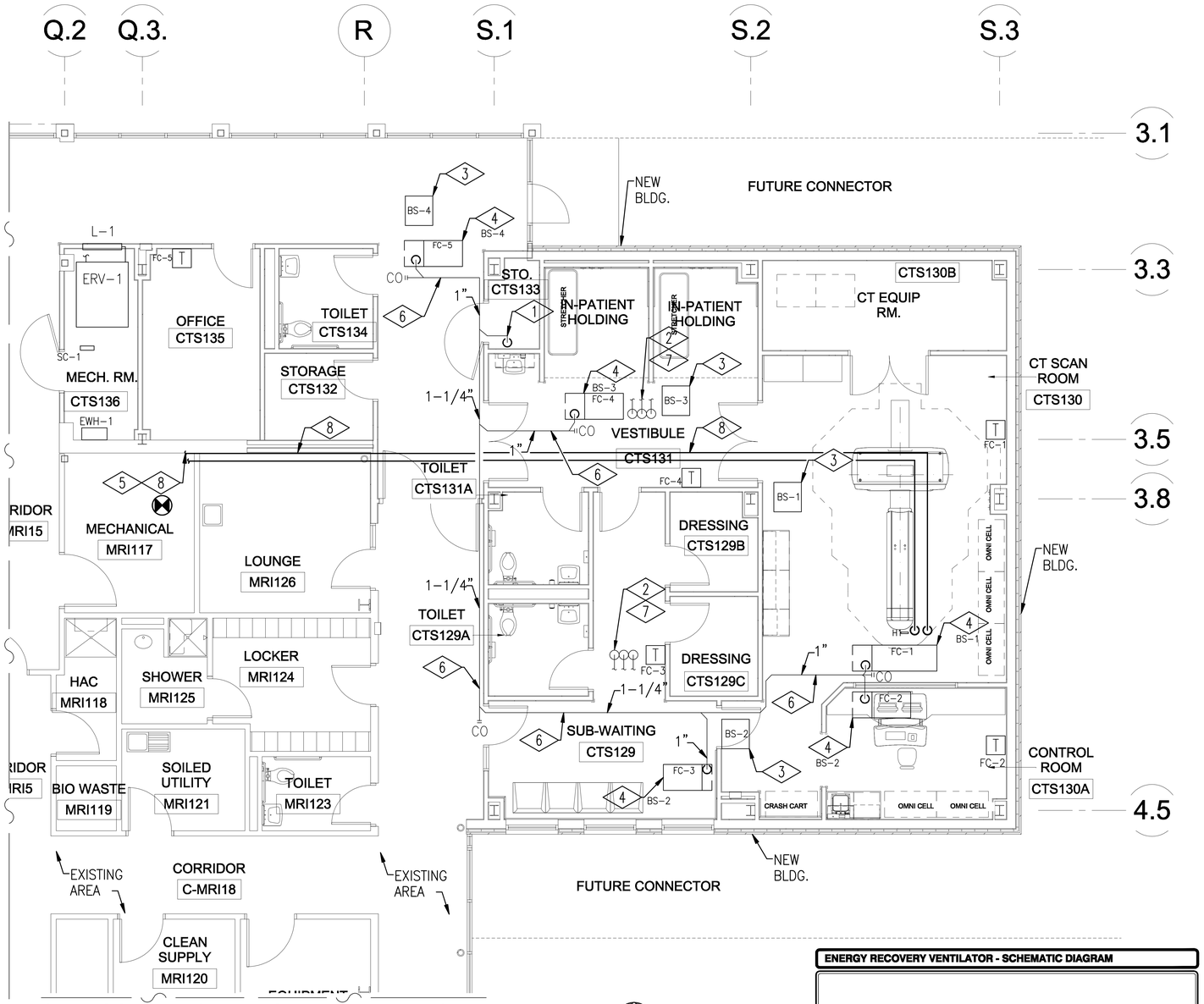
Revised By:

Drawing Title	MECHANICAL HVAC NEW WORK PLANS
Project Title	SITE PREP FOR CT SCANNER
Date	01–31–2013
Project No.	552–CSI–333
Approved: Project Manager	RANDI FIORINA
Building Number	335
Checked	PNS
Drawn	CONTECH
Drawing No.	MH 2.0
Approved: Service Chief	GARY ABREU
Location	4100 WEST THIRD STREET DAYTON, OH 45428

VAMC, DAYTON

Department of Veterans Affairs

VA FORM 08–6231, OCT 1978

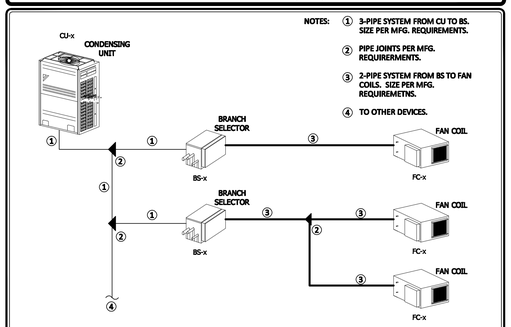


FIRST FLOOR HVAC PIPING PLAN - NEW WORK

SCALE: 1/4" = 1 FOOT

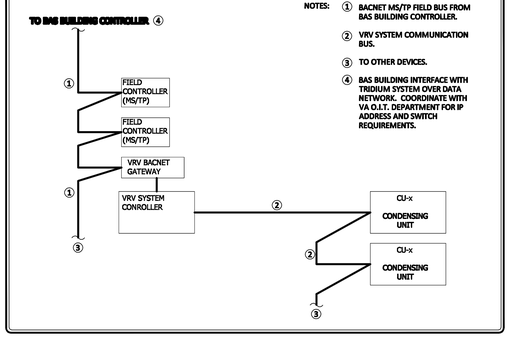
NORTH

REFRIGERANT PIPING SCHEMATIC - CU-X (TYP)



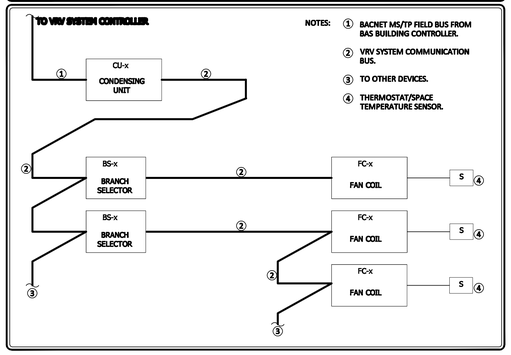
NOTES:
1. 3-PIPE SYSTEM FROM CU TO BS. SIZE PER MFG. REQUIREMENTS.
2. PIPE JOINTS PER MFG. REQUIREMENTS.
3. 2-PIPE SYSTEM FROM BS TO FAN COILS. SIZE PER MFG. REQUIREMETNS.
4. TO OTHER DEVICES.

CENTRALIZED CONTROL WIRING SCHEMATIC



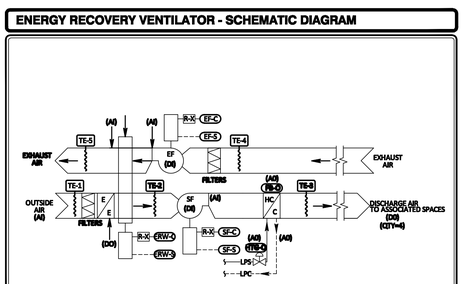
NOTES:
1. BACNET MS/TP FIELD BUS FROM BAS BUILDING CONTROLLER.
2. VRV SYSTEM COMMUNICATION BUS.
3. TO OTHER DEVICES.
4. BAS BUILDING INTERFACE WITH TRIDIUM SYSTEM OVER DATA NETWORK. COORDINATE WITH VA O.I.T. DEPARTMENT FOR IP ADDRESS AND SWITCH REQUIREMENTS.

WIRING SCHEMATIC - CU-X (TYP)



NOTES:
1. BACNET MS/TP FIELD BUS FROM BAS BUILDING CONTROLLER.
2. VRV SYSTEM COMMUNICATION BUS.
3. TO OTHER DEVICES.
4. THERMOSTAT/SPACE TEMPERATURE SENSOR.

ENERGY RECOVERY VENTILATOR - SCHEMATIC DIAGRAM



DRAWING NOTES – MECHANICAL

1. RUN AC CONDENSATE DRAIN PIPING DOWN WALL AND TERMINATE INTO SANITARY DRAIN.
2. VARIABLE REFRIGERANT VOLUME (VRV) MANUFACTURER SHALL PROVIDE REFRIGERANT PIPING LAYOUT AND PIPE SIZING BASED ON CONTRACTORS COORDINATION DRAWINGS WITH FINAL LOCATIONS. PROVIDE REQUIRED CAPACITIES.
3. PROVIDE THREE (3) PIPE (LIQUID, HOT GAS, AND SUCTION) REFRIGERANT LINES FROM BRANCH SELECTOR BOXES (BS-#) TO CONDENSING UNIT PER MANUFACTURER'S ROUTING AND SIZING.
4. PROVIDE TWO (2) PIPE REFRIGERANT LINES FROM BS-BOXES TO EVAPORATOR / FAN COIL UNIT / TERMINAL UNIT PER MANUFACTURER'S ROUTING AND SIZING.
5. NEW STEAM AND CONDENSATE TAP INTO EXISTING LINES PROVIDED FOR MRI-BUILDING 335. PROVIDE FIRE SEALANT ON ANY PENETRATIONS TO ROOM MRI-117.
6. SLOPE ALL AC CONDENSATE DRAIN PIPING DOWN TOWARDS DRAIN AT 1/8" PER FOOT.
7. REFRIGERANT PIPING UP TO ROOFTOP CONDENSING UNIT(S).
8. RUN ¾" STEAM AND ¾" LPC TO DUCT-MOUNTED STEAM HUMIDIFIER COIL FOR CT SCAN SUITE.

VARIABLE REFRIGERANT VOLUME -SYSTEM

SEQUENCE OF OPERATIONS

THE VARIABLE REFRIGERANT VOLUME (VRV) SYSTEM SHALL CONSIST OF AN OUTDOOR CONDENSING UNIT WITH VARIABLE SPEED COMPRESSOR(S) AND MULTIPLE INDOOR FAN COILS. VRV CONTROL SYSTEM SHALL BE BY THE SAME MANUFACTURER AS VRV SYSTEM. THE SYSTEM SHALL BE CONTROLLED ON AN OCCUPIED/UNOCCUPIED TIME SCHEDULE AS DEFINED AT THE OPERATOR WORKSTATION. THE VRV SYSTEM SHALL HAVE CENTRALIZED CONTROLLERS. THE BUILDING AUTOMATION SYSTEM SHALL INTERFACE TO THE VRV SYSTEM CONTROLLER TO ADJUST SETPOINTS, OCCUPY ZONES, AND MONITOR THE SYSTEM.

THE VRV CONDENSING UNIT SHALL MODULATE TO MATCH THE LOAD OF THE CONNECTED INDOOR UNITS.

OCCUPIED MODE:
THE INDIVIDUAL FAN COILS SHALL CYCLE THE FAN UPON A CALL FOR COOLING OR HEATING. THE FAN COIL SHALL OPERATE AT REDUCED LOAD AND VARY THE REFRIGERANT FLOW TO FULL COOLING OR HEATING UNTIL THE SPACE IS AT THE OCCUPIED COOLING OR HEATING SETPOINT. FAN COIL UNIT CONTROLLER SHALL COMMUNICATE WITH THE BRANCH SELECTOR BOX TO CONTROL THE MODE OF OPERATION (HEATING OR COOLING).

UNOCCUPIED MODE:
THE FAN AND DX COOLING COIL SHALL BE CYCLED TO MAINTAIN AN INCREASED UNOCCUPIED SPACE TEMPERATURE SETPOINT.

IN, HEATING MODE, THE FAN AND DX COIL SHALL BE CYCLED TO MAINTAIN DECREASED UNOCCUPIED SPACE TEMPERATURE SETPOINT.

THE UNIT SHALL BE CONTROLLED ON ITS OWN OCCUPIED/UNOCCUPIED TIME SCHEDULE AS DEFINED AT THE OPERATOR WORKSTATION.

ROOM HUMIDITY CONTROL (CT SCAN SUITE ONLY):
AIR FLOW PROVING SWITCH SHALL PROVE AIR FLOW BEFORE STEAM CONTROL VALVE IS ALLOWED TO OPEN.

THE HUMIDIFIER STEAM CONTROL VALVE SHALL BE MODULATED TO MAINTAIN A SPACE HUMIDITY SETPOINT OF 50% R.H.

A DUCT HIGH LIMIT HUMIDISTAT SHALL PREVENT THE HUMIDIFIER DISCHARGE AIR FROM RISING ABOVE 80% RH. AS THE DISCHARGE AIR HUMIDITY APPROACHES THE HIGH LIMIT, THE HUMIDIFIER CONTROL VALVE SHALL BE MODULATED TOWARD THE FULLY CLOSED POSITION.

SYSTEM POINTS:

TYPE	DESCRIPTION	QUANTITY
AI	SPACE TEMPRATURE	1 (PER FAN COIL)
AO	SPACE OCCUPIED SETPOINT	1 (PER FAN COIL)
AO	SPACE UNOCCUPIED SETPOINT	1 (PER FAN COIL)
DO	OCCUPIED COMMAND	1 (PER FAN COIL)
AO	VRV CONDENSING UNIT COMMAND	1 (PER COND. UNIT)
AI	VRV SYSTEM LOAD %	1 (PER COND. UNIT)
DI	VRV CONDENSING UNIT STATUS	1 (PER COND. UNIT)
DI	FAN COIL FAULT	1 (PER FAN COIL)
DI	VRV CONDENSING UNIT FAULT	1 (PER COND. UNIT)
AI	SPACE HUMIDITY	1 (CT UNIT ONLY)
AO	HUMIDIFIER VALVE COMMAND	1 (CT UNIT ONLY)

ERV-1 OPERATION

SEQUENCE OF OPERATIONS: ENERGY RECOVERY VENTILATOR (ERV)

MODE CONTROL -
THE ERV SHALL OPERATE WHEN THE BUILDING IS OCCUPIED OR ANY OF THE FAN COILS ARE IN THE OCCUPIED MODE. THE SUPPLY FAN, EXHAUST FAN, AND ENERGY RECOVERY WHEEL SHALL OPERATE WHEN ERV IS IN OPERATION.

DEFROST CONTROL -
THE DEFROST HEATER SHALL OPERATE WHEN SENSOR DETERMINES THAT THE ENERGY RECOVERY WHEEL IS FROSTING.

DISCHARGE AIR CONTROL -
THE STEAM HEATING VALVE AND FACE & BYPASS DAMPER SHALL BE MODULATED IN SEQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT A NEAUTRAL AIR TEMPERATURE. THE STEAM VALVE SHALL BE FULLY OPEN BEFORE THE FACE AND BYPASS DAMPER BEGINS TO OPEN TO THE COIL.

SYSTEM POINTS:

TYPE	DESCRIPTION	QUANTITY
AI	OUTSIDE/ERV ENTERING AIR TEMPERATURE	1
AI	ERV DISCHARGE AIR TEMPRATURE	1
AI	ERV EXHAUST AIR ENTERING TEMPERATURE	1
AI	ERV EXHAUST AIR LEAVING TEMPERATURE	1
AI	DISCHARGE AIR TEMPERATURE	1
AO	DISCHARGE AIR SETPOINT	1
AO	STEAM HEATING VALVE COMMAND	1
AO	FACE & BYPASS DAMPER COMMAND	1
DO	OCCUPIED COMMAND	1
DO	SUPPLY FAN COMMAND	1
DO	EXHAUST FAN COMMAND	1
DO	ENERGY RECOVERY WHEEL COMMAND	1
DI	SUPPLY FAN STATUS	1
DI	EXHAUST FAN STATUS	1
DI	ENERGY RECOVERY WHEEL STATUS	1
DO	MOTOR-OPERATED DAMPER	2

3023.00

ISSUED FOR BIDDING	01-31-2013
Revisions	Date

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Revised By:

Drawing Title	MECHANICAL PIPING NEW WORK FLOOR PLANS
Project Title	SITE PREP FOR CT SCANNER
Date	01-31-2013
Project No.	552-CSI-333
Approved: Project Manager	RANDI FIORINA
Building Number	335
Checked	PNS
Drawn	CONTECH
Drawing No.	MH 2.1
Approved: Service Chief	GARY ABREU
Location	4100 WEST THIRD STREET DAYTON, OH 45428

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